

CLAIMS

I claim:

1. A permanent magnetic liquid treating device (1) comprising
- a tubular housing (2) in which ring magnets (3) and magnetizable spacer discs (4) are located, coaxially to the longitudinal axis of the housing, and which has connecting pieces (5) at both ends, and comprising means causing a spiral motion of the liquid passing therethrough, and
- an inner tube (6) which is located in the housing, coaxially to the longitudinal axis thereof and at a distance from the inner wall of the housing, the ends of said inner tube being connected liquid-tightly to said connecting pieces, the liquid to be treated flowing through said inner tube, and the ring magnets (3) and spacer discs (4) being installed in the liquid-free space between the inner tube (6) and the tubular housing (2) in such a way that they lie one behind the other in the direction of the longitudinal axis of the housing, characterized by the following features:
- a) the tubular housing (2) consists of a non-magnetizable material;
  - b) the inner tube (6) consists of a magnetizable rustproof metal;
  - c) the tubular connecting pieces (5) consisting of a magnetizable rustproof metal extend the inner tube (6) and form a single piece therewith;
  - d) the ring magnets (3) which are identical to each other are arranged in the ring space between the housing (2) and the inner tube (6) so that, beginning from the liquid inlet (E), there follow, after a single spacer disc (4), a ring magnet (3) with its south pole directed towards the inlet, then, each time after two single spacer discs (4), three ring magnets (3) with the polarity inverted from one to the next, and at last two twinned ring magnets (3a, 3b), again with polarity inverted in relation to the preceding ring magnet and to the following twinned ring magnet, the single ring magnets (3a, 3b) which constitute

each twinned magnet contacting each other with opposite poles so that a south pole is at the outside of the stack, and a final thicker spacing disc (4).

e) the complete stack of ring magnets (3) and spacer discs (4) is held immovable and tightly enclosed in the housing (2) by means of sleeves (9) screwed upon the connecting pieces (5);

f) in the inner tube (6) there is fixedly held a strip (7) consisting of a magnetizable rustproof metal having a width corresponding to the inner diameter of the inner tube (6), said strip being wound to a helix with 1 to 3 turns;

g) the metal strip (7) extends with each one of its end sections (8) into the connecting pieces (5), said end sections being without helix and diametrically opposed.

2. A permanent magnetic liquid treating device according to claim 1, characterized in that the housing (2) consists of aluminum or an aluminum alloy and that the inner tube (6), the connecting pieces (5) and the end sleeves which are screwed upon the threading of the connecting pieces consist of special steel.

3. A permanent magnetic liquid treating device according to one of claims 1 or 2, characterized in that the axial dimension of each ring magnet (3) is 9 mm and that of the spacer discs (4) is 3 mm, and the last spacer disc (4) at the outlet side having a thickness of 6 mm.

4. A permanent magnetic liquid treating device according to any of claims 1 to 3, characterized in that the inner tube (6) has a diameter of 0.5 inch (12.6 mm) and a length of 100 mm. and that the helically wound strip (7) being prepared from a sheet of special steel of 0.5 mm thickness has 1 to 2 helix windings in the inner tube.

5. A permanent magnetic liquid treating device according to any of the preceding claims, characterized in that an elastic sealing ring (10) surrounding the inner tube (6) is inserted between each of the outwardly last spacer discs (4) and the adjacent sleeve (9).

6. A permanent magnetic liquid treating device according to any of claims 1 to 5, characterized in that the helically wound strip (7) is smooth or provided with projections which serve to create turbulence within the liquid flowing therethrough.

7. A permanent magnetic liquid treating device according to any of the claims 1 to 6, characterized in that the helix-free diametrical terminal section (8) of the metal strip (7) at the inlet end extends outwardly from the connecting piece (5) and terminates in a tip (14) with rounded straight edges or in a rounded tip (12) with a rounded round edge (12a).

8. A permanent magnetic liquid treating device according to any of claims 1 to 7, characterized in that at least the edges (14a, 12a) of the tips (14, 12) of the strip (7) have a coating of plastics material.

9. A permanent magnetic liquid treating device according to any of the claims 1 to 8, characterized in that both sides of the strip (7) are covered with a plastic coating.

10. A permanent magnetic liquid treating device according to any of the claims 1 to 9, characterized in that an insert (11) which reduces the flow section is arranged in the connecting piece (5) which is situated at the outlet side.

11. A permanent magnetic liquid treating device according to any of the claims 1 to 10, characterized in that the terminal outer part of the connecting pieces (5) is provided with a threading or smooth undulations for connection with a connecting pipe or tube, respectively.

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